AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) An electronic device comprising:
a substrate;
an interconnected network of carbon nanotubes on the surface of the substrate; and
two or more electrical leads on the surface of the substrate;
wherein the network forms an electrical connection between the leads; and
wherein substantially none of the carbon nanotubes is in contact with both of the leads.

2. (original) The device of claim 1, wherein the carbon nanotubes are single-walled carbon nanotubes.

3. (original) The device of claim 1, wherein the network is a sub-monolayer of carbon nanotubes.

4. (currently amended) The device of claim 1, wherein the network is up to about 100 nm thick.

5. (original) The device of claim 1, wherein the density of carbon nanotubes is at most about one thousand times the reciprocal of the square of the average length of the carbon nanotubes.

6. (original) The device of claim 1,
wherein the network comprises metallic single-walled carbon nanotubes; and
wherein the density of the metallic single-walled carbon nanotubes is at most about the reciprocal of the square of the average length of the carbon nanotubes.

7. (original) The device of claim 1, wherein the density of carbon nanotubes is at most about 10 μm^{-2}.

8. (original) The device of claim 1, wherein the density of the carbon nanotubes is at least about one tenth the reciprocal of the square of the average length of the carbon nanotubes.

9. (original) The device of claim 1, wherein the density of the carbon nanotubes is at least about 0.3 μm^{-2}

10. (original) The device of claim 1, wherein at least about 75% of the carbon nanotubes are at least partially in contact with the substrate.

11. (original) The device of claim 1, wherein the network is semiconducting.

12. (canceled)

13. (original) The device of claim 1, wherein the network further comprises a filler material.

14. (original) The device of claim 13, wherein one or more electrical properties of the filler material are altered by the network.

15. (original) The device of claim 13, wherein the filler material is a polymer.

16. (original) The device of claim 1, wherein the distance between the leads is greater then the average length of the carbon nanotubes.

17. (canceled)

18. (original) The device of claim 1, wherein the substrate is flexible.

19. (original) The device of claim 1, further comprising a gate lead;
wherein the device is a field effect transistor;
wherein the leads electrically connected to the network form a source and a drain of the transistor; and
wherein the network forms a conduction channel of the transistor.

20. (original) The device of claim 19, further comprising an insulating material between the network and the gate.

21. (original) The device of claim 19, wherein the gate is part of the substrate.

22. (original) The device of claim 19, wherein the transistor has an on-to-off ratio of at least about 10^5.

23. (original) The device of claim 19, wherein the substrate is flexible.

24. (original) The device of claim 1,
wherein the network can be exposed to a gaseous sample; and
wherein the resistivity of the network changes in response to the presence of one or more analytes in the sample.

25. (original) The device of claim 24, wherein the substrate is flexible.

26. (original) The device of claim 24, wherein substrate is a tube and the network is on the inside surface of the tube.

27. (original) The device of claim 26, wherein the tube comprises quartz.

28. (original) The device of claim 24, wherein the electrical leads comprise silver.

29. (original) A display device comprising the device of claim 1.

30. (currently amended) An electronic device comprising:
a substrate;
an interconnected network of nanofilaments on the surface of the substrate;
two or more electrical leads on the surface of the substrate;
wherein the network forms an electrical connection between the leads; and
wherein substantially none of the nanofilaments is in contact with both of the leads.

31. (new) The device of claim 1, wherein none of the nanotubes is in contact with both of the leads.

32. (new) The device of claim 1, wherein at least one of the carbon nanotubes is in contact with neither of the leads.

33. (new) The device of claim 1, wherein the substrate is substantially free of catalyst.

34. (new) The device of claim 19, wherein the conductivity of the network is modulated by a voltage applied to the gate.

35. (new) The device of claim 30, wherein none of the nanofilaments is in contact with both of the leads.

36. (new) The device of claim 30, wherein at least one of the nanofilaments is in contact with neither of the leads.

37. (new) The device of claim 30, wherein the substrate is substantially free of catalyst.

38. (new) A field effect transistor comprising:

a substrate;

an interconnected network of carbon nanotubes on the surface of the substrate;

a source lead;

a drain lead; and

a gate lead

wherein the network forms a conduction channel of the transistor between the source and drain; and

wherein the transistor has an on-to-off ratio of at least about 10^5.

39. (new) An electronic device comprising:

a substrate;

an interconnected network of carbon nanotubes on the surface of the substrate; and

two or more electrical leads;

wherein the network forms an electrical connection between the leads;

wherein the network can be exposed to a gaseous sample;

wherein the resistivity of the network changes in response to the presence of one or more analytes in the sample; and

wherein substrate is a tube and the network is on the inside surface of the tube.

40. (new) The device of claim 39, wherein the tube comprises quartz.

Amendment to Prior Art Reference CG4)

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-6 (canceled)

7. (currently amended) A ~~device for sensing specific molecules, the device~~ sensor comprising:

a substrate;

a ~~nanostructure~~ nanoelement having first and second ends disposed on the substrate; and

two electrodes disposed on the substrate ~~connected by the nanostructure, wherein at least one~~ each electrode contacting an end of the nanotube, one electrode including a surface layer including Pd ~~and a junction between the electrode and the nanostructure defines a sensing element for the specific molecules~~.

8-40. (canceled)

41. (new) The sensor of claim 7, wherein the substrate includes a gate electrode disposed between the two electrodes and beneath the nanoelement.

42. (new) The sensor of claim 7, wherein the nanoelement is a nanowire.

43. (new) The sensor of claim 7, wherein the nanoelement is a nanotube.

44. (new) The sensor of claim 43, further comprising a network of interconnected nanotubes including the nanotube.

45. (new) The sensor of claim 7, wherein the nanoelement is an inorganic nanorod.

46. (new) A bio-molecule sensor comprising:

a substrate;

a nanotube having first and second ends disposed on the substrate; and

a pair of electrodes disposed on the substrate, each electrode contacting an end of the nanotube, one electrode comprising a surface layer including a molecule with an affinity for the bio-molecule.

47. (new) The bio-molecule sensor of claim 46 wherein the surface layer includes biotin.

48. (new) The bio-molecule sensor of claim 46 wherein the bio-molecule is streptavidin.

49. (new) The bio-molecule sensor of claim 46 wherein one electrode of the pair of electrodes comprises a layer of Au over a layer of Pd.

50. (new) A sensor for a specific molecule comprising:

a substrate;

a nanoelement having first and second ends disposed on the substrate;

a pair of electrodes disposed on the substrate, each electrode contacting an end of the nanoelement; and

a protective layer over the nanoelement.

51. (new) The sensor of claim 50, wherein the nanoelement is a nanowire.

52. (new) The sensor of claim 50, wherein the nanoelement is an inorganic nanorod.

53. (new) The sensor of claim 50, wherein the nanoelement is a nanotube.

54. (new) The sensor of claim 53, further comprising a network of interconnected nanotubes including the nanotube.

55. (new) The sensor of claim 50, wherein the substrate includes a gate electrode disposed between the two electrodes and beneath the nanoelement.

56. (new) The sensor of claim 50, further comprising a surface layer on one electrode of the pair of electrodes, the surface layer having an affinity for the specific molecule.

57. (new) The sensor of claim 50, wherein the protective layer includes a polymer.

58. (new) A method of sensing a specific molecule comprising:

providing a sensor including a nanoelement disposed between two electrodes;

exposing the chemical sensor to an environment including the specific molecule; and

measuring a change in a work function of one of the two electrodes in response to the environment.

59. (new) The method of claim 58 wherein one of the electrodes includes a surface layer having an affinity for the specific molecule.

60. (new) The method of claim 58 wherein providing the sensor further includes providing a gate electrode disposed between the two electrodes and beneath the nanoelement.

61. (new) The method of claim 60 further comprising applying a gate voltage to the gate electrode to alter the Schottky barrier at a junction between the nanoelement and the one of the two electrodes.

62. (new) The method of claim 58 wherein providing the sensor further includes providing a protective layer over the nanoelement.

63. (new) The method of claim 58 wherein measuring the change in the work function includes measuring a Schottky barrier defined between the nanoelement and the one of the two electrodes.

64. (new) The method of claim 63 wherein measuring the Schottky barrier includes measuring a contact resistance.